

**FAST PROTECTION SWITCHING BY SNOOPING
ON UPSTREAM SIGNALS IN AN OPTICAL NETWORK**

ABSTRACT OF THE DISCLOSURE

5 An optical network has an optical splitter connected to (1) a working optical subscriber unit
(OSU) of a working circuit via a working optical fiber, (2) a protection OSU of a protection circuit via a
protection optical fiber, and (3) one or more optical network terminals (ONTs). The present invention
enables fast protection switching from the working OSU to the protection OSU. In one embodiment, the
arrival times of corresponding upstream ranging reply PLOAM cells are measured at both the working
0 and protection OSUs during ranging operations of the working OSU. In another embodiment, a cell
delineation procedure is initiated at the protection OSU during normal, non-ranging operations of the
working OSU to enable the protection OSU to correctly delineate upstream cells and the arrival times of
corresponding upstream cells are then measured at both the working and protection OSUs. In either case,
a propagation delay value is generated based on the measured arrival times for use by the protection OSU
5 for communications with the one or more ONTs if and when protection switching is implemented upon
detection of a failure in the working circuit, possibly without requiring the protection OSU to perform
any ranging for the one or more ONTs.